Application No.: 10/809,169
Docket No.: PE0667USDIV2

REMARKS

Status of the Application

Claims 1-7, 9, 12, and 14-20 are pending in the application. The pending claims are rejected under 35 U.S.C. § 102 over three references. The rejections are addressed separately below.

Claim Amendments

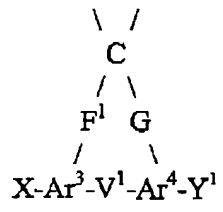
Claim 1 is amended to further the prosecution by specifying that the at least first monomeric unit has a formula selected from the group consisting of Formulae I and I(a) and that R groups pendant from the Formula I monomeric unit, when they form a ring, form a single ring of the type specified, and that in such case any R^1 may be neither aryl nor heteroaryl.

Claim Rejections – 35 U.S.C. § 102

Claims 1-7, 9, 12, and 14-20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kreuder, Kim '864 or Kim '974.

Kreuder

Kreuder, U.S. Patent No. 5,763,636, discloses in formula (I) the spiro-containing SRU as shown below, in relevant part. In the scheme below, C is the spiro atom, F^1 and G are $-CR^1R^1-$, -O-, -S-, $-NR^3-$ or a chemical bond, Ar^3 and Ar^4 are defined at Col. 2, lines 43-53, V^1 is $-CR^5=CR^6$, $-CR^7R^8-$, $-CR^9R^{10}-$, $-CR^{11}R^{12}-$, $-NR^3-$, $SiR^{14}R^{15}-$, -O-, -S-, -So-, SO_2-, -CO-, or a chemical bond (Col. 2, lines 54-57), and X and Y^1 are alike or different, cyclic or acyclic, conjugated hydrocarbons having from 2-100 (preferably 2-20) carbon atoms, which can also contain heteroatoms such as N, O, and/or S, and which can be substituted by one or more radicals, and can be H (Col. 2, lines 58-64):



The top portion of the SRU is capped at either end by $-[Ar^5]_n-$ and $-[Ar^6]_p-$. Please see in general Col. 2, lines 26-64.

Ar^3 and Ar^4 are *always* –triyl (trivalent) whether they are aromatic or alicyclic, heteroaromatic or hetercyclic (please see Col. 2, lines 43-53 and associated text in claims 1 and 9) so that the pendant spiro unit in all of Kreuder's molecules is tricyclic in every instance. These are exemplified by the structures associated with Examples 7 – 10 and with the nomenclature of the other working examples. In the instances in which a monomer of a copolymer of the claims under review forms a spiro compound, there is pendant only a single ring, by definition in, e.g., claim 1, "adjacent R groups can form a 5- or 6- membered * * * ring" and R^1 by definition is a substituent on an R group and R^1 does not, by definition, form additional rings. As noted above, claim 1 is amended to set this forth explicitly.

Therefore, Applicants respectfully submit, this rejection is rendered moot by amendment on the grounds that Kreuder does not disclose compounds of the claims, as amended, but rather discloses spiro compositions in which both moieties according to Kreuder's formula (I) and definitions have tricyclic systems. Applicants respectfully submit that this rejection is now moot should therefore be withdrawn.

Kim '864

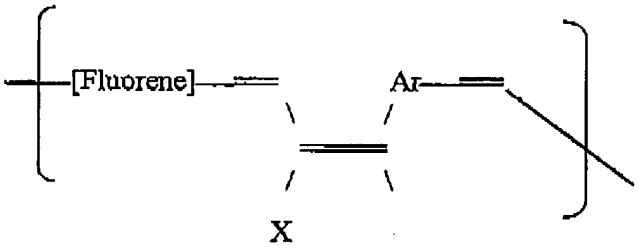
Applicants respectfully maintain their traverse of this rejection. To anticipate claims under review, the single prior art reference must disclose each and every limitation in the claims, in the order therein presented, and must enable the claimed invention. Kim '864 discloses a polymer described in the Abstract as a fluorene-based alternating polymer.

The present claims are directed to a copolymer having at least one fluorene-based comonomer having Formula I or Formula I(a) and at least one comonomer having a 6-membered heteroaromatic ring of Formula III (please see, e.g., claim 1), and as shown in the formulae, the linkages between both Formula I and Formula I(a) monomers and any other monomer is by single carbon-carbon bond. Similarly, the linkages between the Formula III monomer and any other monomer, represented by E in Formula III, is by single bond or a linking group selected from arylene or heteroarylene, both of which are bivalent radicals formed by removal of –H from two carbon sites on the aromatic nucleus, and thus also link to neighboring moieties via single carbon-carbon bonds. There is no acetylene bridge linkage, as in Kim '864, linking the fluorene moiety to another monomer or an end-capping group, as the case may be. In Kim '864, as shown in formula (I) the basic structural repeat unit (SRU) or backbone of the alternating

polymer includes -≡-Ar- on the right of the fluorene group, where Ar represents substituted or unsubstituted phenyl, and -≡- to the left of the fuorene group, as illustrated in the formulae shown at Col. 4, line 50 to Col. 7, line 5, as well as the acetylene group on each end of the SRU (also the Abstract, Col. 4, lines 17-23, and claim 1). Kim '864 does not disclose the single bond linkages between fluorene and/or non-fluorene-based comonomers as required in the present claims. Because Kim '864 does not disclose this significant structural feature of the claimed copolymers and, in fact, discloses a different structure, Kim '864 does not anticipate the pending claims. Applicants respectfully request that this rejection be withdrawn and not maintained.

Kim '974

Applicants respectfully maintain their traverse of this rejection, also. Kim '974 also discloses a fluorene-based alternating copolymer (Abstract). Formula (I) in Kim '974 depicts an SRU that contains a fluorene group and a side chain,



Again, there is no there is no vinylene bridge between comonomers (here, fluorene and Ar) in the present claims. Like Kim '864, Kim '974 discloses a different structure than those of the present claims, having vinylene bridges between comonomers, a feature absent from the claims, and does not disclose single bond linkages between comonomers as required by the present claims. For these reasons, Kim '974 does not anticipate the pending claims. Applicants respectfully request that this rejection be withdrawn and not be maintained further.

Conclusion

Applicants respectfully submit that a fully responsive paper is provided herein and that all pending objections and rejections have been overcome or rendered moot by the foregoing amendments and remarks. Accordingly, Applicants respectfully assert that the pending claims are in condition for allowance, and earnestly solicit a notice of allowance.

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Dated: January 16, 2007